

## Author Index to Volume 21

In this index are listed names of authors and titles of their articles and notes. Abstracts of papers read at meetings are designated by the letter (A) after the number of the page on which the abstract may be found. Papers read at meetings for which an abstract has not been published are not included; however, they are indexed in the Analytical Subject Index. The symbol (L) after an entry signifies a Letter to the Editor.

- Adams, C. E. (see Mitchell, John)—499(A)  
 Adams, Carl E. How to read science; another approach to general education—494(A)  
 Adler, R. B. Physics for students of electrical communication—560  
 Ainalie, Donald S. Direct experimental method of measuring the ampere in absolute units—657(A)  
 Allen, William A. Two ballistics problems of future transportation—83  
 Amar, Henri and Carl Oberman. Nonplanar circuit with a steady current in a uniform magnetic field—518  
 Anderson, Orson L. Extension of remarks on the derivation of the stress deviator tensor—65(L)  
 Andrews, C. L. Review of *Essentials of microwaves*—394  
 Aronow, Saul. Equivalent networks of electron tubes—314  
 Bacon, Ralph Hoyt. "Best" straight line among the points—428  
 Bade, W. L. Relativistic rocket theory—310  
 Baez, Albert V. Entertaining demonstration using window glass as a mirror—63  
 —Kundt's tube projection demonstration—64(L)  
 —Physics teaching in Baghdad—239(A)  
 —and F. W. Warburton. Magnetic tape recorder as a teaching aid in physics—499(A)  
 Baker, Donald H. Review of *The radio amateur's handbook*—581  
 Baker, Grover C. and George E. Bradley. Small scale dc motor experiment for the elementary laboratory—689  
 Ballard, Stanley S. Undergraduate student participation in academic research—404(A)  
 Barbour, J. P. (see Dyke, W. P.)—497(A)  
 Barker, J. R. and R. O. Davies. Calculus of measures and its application to the relation between rationalized and unrationalized electromagnetic systems—281  
 Barnes, George. Bragg method demonstrated with sound waves—688  
 —Freshmen laboratory experiment in echo ranging—572  
 —Negative coefficient of expansion of stretched rubber—142(L)  
 Barr, E. Scott. Review of *Mr. Tompkins learns the facts of life*—649  
 —Sharp shadows as "images"—493(A)  
 Barthel, R. Review of *Cosmology—elements of a critique of the sciences and of cosmology*—395  
 Barthel, Romard. Ultrasonic interferometer as a screw calibrating instrument—316(L)  
 Bartlett, A. A. (see Saunders, Norman)—496(A)  
 Bartlett, Albert A. Meeting of the Colorado-Wyoming Section—495  
 Bartunek, Paul F. Some remarks on Meide's experiment—495(A)  
 Beck, Clifford and Raymond L. Murray. Review of *The elements of nuclear reactor theory*—396  
 Beiser, Arthur. Review of *Modern physics*—318  
 Belinfante, Frederik J. How much is a billion?—474(L)  
 —International language for science?—142(L)  
 Belknap, George M. Review of *A policy for scientific and professional manpower*—581  
 Bell, Raymond M. and Harry Hill. Dissipation factor anomaly—389  
 Bender, David F. Meeting of Southern California Section—239  
 Benumof, Reuben and Mitchel Benumov. Shearing stress in a closely coiled helical spring—62  
 Benumov, Mitchel (see Benumof, Reuben)—62  
 Berko, Stephen. Simple apparatus for central force investigations in an advanced undergraduate laboratory—407(A)  
 Besdin, D. J., J. R. Shewell, and Ernest Ikenberry. Motion of a conducting sphere in a uniform magnetic field—418  
 Beyer, Robert T. Review of *Textbook on sound*—319  
 Blatt, J. M. (see Weinberg, Izabella Goldin)—124  
 Blisard, Thomas J. and Bernard A. Greenbaum. Demonstrations to provide data for student computation in electricity—109  
 Blumenthal, I. S. Operating principles of synchrotron accelerators—164  
 Bobrovnikoff, N. T. Review of *Comets and meteor streams*—320  
 Boynton, W. P. Teaching physics 1900 to 1906—240(A)  
 Bozorth, R. M. Behavior of magnetic materials—260  
 Brabant, John M. Extrapolation chamber for determining beta-ray surface-dosage rates—238(A)  
 Bracewell, Kent H. Prismatic reflections—584(A)  
 Bradley, George E. Echo ranging with audio frequencies—159  
 Bradley, George E. (see Baker, Grover C.)—689  
 Breit, G. and M. H. Hull, Jr. Advances in knowledge of nuclear forces—184  
 Brewington, G. P. Avenues of cooperation between physics and the engineering college—404(A)  
 Brick, Rowan O. Reflection and transmission of microwaves through prisms of sulfur and salt—498(A)  
 Brillouin, L. Review of *The scientific adventure, essays in the history and philosophy of science*—651  
 Brinker, Bernard L. "Cycle" in a physical interpretation of Planck's constant ( $h$ ) for circular dynamics—74(A)  
 —Muller microscope—74(A)  
 Brown, Sanborn C. Survey of elementary physics laboratories—411  
 Brown, T. B., Chairman. Taylor Memorial Laboratory Manual—487, 564  
 Brown, Thomas B. Cardinal points of a compound lens: an advanced laboratory experiment—406(A)  
 Brownell, L. E. (see Nehemias, John V.)—405(A)  
 Bruch, Margarete. Impression of great German scientists as recalled by a student of physics in Munich in the early 1930's—322(A)  
 Bullen, T. G. Audible repeating time signal device—645  
 —Simple method of determining the latent heat of steam—645  
 Bulliet, Mildred. Preparation of specimens for use in an electron microscope—321(A)  
 Burch, D. S. and R. Geballe. Falling chain—an exact method—497(A), 570  
 Burk, D. and T. Fields. Projection oscilloscope—401(A)  
 Burk, D. L. and T. H. Fields. Projection oscilloscope—657(A)  
 Butler, William A. Photodisintegration of  $\text{Mo}^{92}$  and  $\text{Mo}^{100}$ —584(A)  
 Cahn, Julius H. (see Jehle, Herbert)—526  
 Callihan, Dixon. Meeting of Southeastern Section, American Physical Society—492  
 Cardwell, A. B. (see Leaf, Boris)—580  
 Chapman, Seville. Review of *Flying saucers*—479  
 Chen, Henry S. C. Note on the design of the spherometer—658(A)  
 —Note on the study of uniformly accelerated motion—657(A)  
 —Oblique coordinates in general physics—404(A)  
 Ch'en, Shang Yi. Selected experiments for a course in advanced optics—406(A)  
 Christy, R. F. Review of *Mesons—a summary of experimental facts*—397  
 Clark, W. P. Note on authority—578(L)  
 Cleveland Forrest F. International language for science—471(L)  
 Cohn, Ernst M. and Morris Mentser. C.g.s. units of magnetic susceptibility and specific magnetization—681  
 Cole, Edgar M. (see Robinson, Lawrence B.)—469  
 Coleman, E. W. (see Nehemias, John V.)—405(A)  
 Collins, R. E. New analogy in transient heat conduction—501  
 Combes, Lewis S. Physical-optics approach to lens and mirror problems—409(A)  
 Compton, Charles A. Secondary school textbook—537  
 Cook, C. Sharp. Course in electromagnetic radiation for seniors—542  
 Cooper, John N. Review of *Electronics, physical principles, and applications*—580

## Author Index to Volume 21

In this index are listed names of authors and titles of their articles and notes. Abstracts of papers read at meetings are designated by the letter (A) after the number of the page on which the abstract may be found. Papers read at meetings for which an abstract has not been published are not included; however, they are indexed in the Analytical Subject Index. The symbol (L) after an entry signifies a Letter to the Editor.

- Adams, C. E. (see Mitchell, John)—499(A)  
 Adams, Carl E. How to read science; another approach to general education—494(A)  
 Adler, R. B. Physics for students of electrical communication—560  
 Ainalie, Donald S. Direct experimental method of measuring the ampere in absolute units—657(A)  
 Allen, William A. Two ballistics problems of future transportation—83  
 Amar, Henri and Carl Oberman. Nonplanar circuit with a steady current in a uniform magnetic field—518  
 Anderson, Orson L. Extension of remarks on the derivation of the stress deviator tensor—65(L)  
 Andrews, C. L. Review of *Essentials of microwaves*—394  
 Aronow, Saul. Equivalent networks of electron tubes—314  
 Bacon, Ralph Hoyt. "Best" straight line among the points—428  
 Bade, W. L. Relativistic rocket theory—310  
 Baez, Albert V. Entertaining demonstration using window glass as a mirror—63  
 —Kundt's tube projection demonstration—64(L)  
 —Physics teaching in Baghdad—239(A)  
 —and F. W. Warburton. Magnetic tape recorder as a teaching aid in physics—499(A)  
 Baker, Donald H. Review of *The radio amateur's handbook*—581  
 Baker, Grover C. and George E. Bradley. Small scale dc motor experiment for the elementary laboratory—689  
 Ballard, Stanley S. Undergraduate student participation in academic research—404(A)  
 Barbour, J. P. (see Dyke, W. P.)—497(A)  
 Barker, J. R. and R. O. Davies. Calculus of measures and its application to the relation between rationalized and unrationalized electromagnetic systems—281  
 Barnes, George. Bragg method demonstrated with sound waves—688  
 —Freshmen laboratory experiment in echo ranging—572  
 —Negative coefficient of expansion of stretched rubber—142(L)  
 Barr, E. Scott. Review of *Mr. Tompkins learns the facts of life*—649  
 —Sharp shadows as "images"—493(A)  
 Barthel, R. Review of *Cosmology—elements of a critique of the sciences and of cosmology*—395  
 Barthel, Romard. Ultrasonic interferometer as a screw calibrating instrument—316(L)  
 Bartlett, A. A. (see Saunders, Norman)—496(A)  
 Bartlett, Albert A. Meeting of the Colorado-Wyoming Section—495  
 Bartunek, Paul F. Some remarks on Meide's experiment—495(A)  
 Beck, Clifford and Raymond L. Murray. Review of *The elements of nuclear reactor theory*—396  
 Beiser, Arthur. Review of *Modern physics*—318  
 Belinfante, Frederik J. How much is a billion?—474(L)  
 —International language for science?—142(L)  
 Belknap, George M. Review of *A policy for scientific and professional manpower*—581  
 Bell, Raymond M. and Harry Hill. Dissipation factor anomaly—389  
 Bender, David F. Meeting of Southern California Section—239  
 Benumof, Reuben and Mitchel Benumov. Shearing stress in a closely coiled helical spring—62  
 Benumov, Mitchel (see Benumof, Reuben)—62  
 Berko, Stephen. Simple apparatus for central force investigations in an advanced undergraduate laboratory—407(A)  
 Besdin, D. J., J. R. Shewell, and Ernest Ikenberry. Motion of a conducting sphere in a uniform magnetic field—418  
 Beyer, Robert T. Review of *Textbook on sound*—319  
 Blatt, J. M. (see Weinberg, Izabella Goldin)—124  
 Blisard, Thomas J. and Bernard A. Greenbaum. Demonstrations to provide data for student computation in electricity—109  
 Blumenthal, I. S. Operating principles of synchrotron accelerators—164  
 Bobrovnikoff, N. T. Review of *Comets and meteor streams*—320  
 Boynton, W. P. Teaching physics 1900 to 1906—240(A)  
 Bozorth, R. M. Behavior of magnetic materials—260  
 Brabant, John M. Extrapolation chamber for determining beta-ray surface-dosage rates—238(A)  
 Bracewell, Kent H. Prismatic reflections—584(A)  
 Bradley, George E. Echo ranging with audiofrequencies—159  
 Bradley, George E. (see Baker, Grover C.)—689  
 Breit, G. and M. H. Hull, Jr. Advances in knowledge of nuclear forces—184  
 Brewington, G. P. Avenues of cooperation between physics and the engineering college—404(A)  
 Brick, Rowan O. Reflection and transmission of microwaves through prisms of sulfur and salt—498(A)  
 Brillouin, L. Review of *The scientific adventure, essays in the history and philosophy of science*—651  
 Brinker, Bernard L. "Cycle" in a physical interpretation of Planck's constant ( $h$ ) for circular dynamics—74(A)  
 —Muller microscope—74(A)  
 Brown, Sanborn C. Survey of elementary physics laboratories—411  
 Brown, T. B., Chairman. Taylor Memorial Laboratory Manual—487, 564  
 Brown, Thomas B. Cardinal points of a compound lens: an advanced laboratory experiment—406(A)  
 Brownell, L. E. (see Nehemias, John V.)—405(A)  
 Bruch, Margarete. Impression of great German scientists as recalled by a student of physics in Munich in the early 1930's—322(A)  
 Bullen, T. G. Audible repeating time signal device—645  
 —Simple method of determining the latent heat of steam—645  
 Bulliet, Mildred. Preparation of specimens for use in an electron microscope—321(A)  
 Burch, D. S. and R. Geballe. Falling chain—an exact method—497(A), 570  
 Burk, D. and T. Fields. Projection oscilloscope—401(A)  
 Burk, D. L. and T. H. Fields. Projection oscilloscope—657(A)  
 Butler, William A. Photodisintegration of  $\text{Mo}^{92}$  and  $\text{Mo}^{100}$ —584(A)  
 Cahn, Julius H. (see Jehle, Herbert)—526  
 Callihan, Dixon. Meeting of Southeastern Section, American Physical Society—492  
 Cardwell, A. B. (see Leaf, Boris)—580  
 Chapman, Seville. Review of *Flying saucers*—479  
 Chen, Henry S. C. Note on the design of the spherometer—658(A)  
 —Note on the study of uniformly accelerated motion—657(A)  
 —Oblique coordinates in general physics—404(A)  
 Ch'en, Shang Yi. Selected experiments for a course in advanced optics—406(A)  
 Christy, R. F. Review of *Mesons—a summary of experimental facts*—397  
 Clark, W. P. Note on authority—578(L)  
 Cleveland Forrest F. International language for science—471(L)  
 Cohn, Ernst M. and Morris Mentser. C.g.s. units of magnetic susceptibility and specific magnetization—681  
 Cole, Edgar M. (see Robinson, Lawrence B.)—469  
 Coleman, E. W. (see Nehemias, John V.)—405(A)  
 Collins, R. E. New analogy in transient heat conduction—501  
 Combes, Lewis S. Physical-optics approach to lens and mirror problems—409(A)  
 Compton, Charles A. Secondary school textbook—537  
 Cook, C. Sharp. Course in electromagnetic radiation for seniors—542  
 Cooper, John N. Review of *Electronics, physical principles, and applications*—580

- (see Oetjen, Robert A.)—221
- Crawford, F. H. Review of *Elements of thermodynamics*—582
- Crawford, Vernon. Notes on the up-and-down vibrations of a hanging chain partly counterbalanced by a suspended body—574
- Problem in electrostatics—391(L)
- Critchfield, Charles L. Review of *Theoretical nuclear physics*—235
- Cuff, William A. Review of *Thousands of science projects*—579
- and Walter C. Michels. Activities and publications of AAPT—475(L)
- David, A. What is the proper examination method?—472(L)
- Davies, R. O. (see Barker, J. R.)—281
- Davis, Kenneth E. Meeting of the Oregon Section—497
- Day, John A. Great men of physics—a teaching device with a cultural approach—498(A)
- De Benedetti, S. Teaching the connection between the physical world and abstract mathematical analysis—73(A)
- Dexter, D. L. Review of *Introduction to solid state physics*—650
- Dodd, Laurence Ellsworth. Closed differential pulley: analysis of its rotational linear motions—112
- Dolan, W. W. (see Dyke, W. P.)—497(A)
- Draper, Arthur L. Zeiss planetarium projector—401(A)
- Dumond, Jesse W. M. Review of *An introduction to scientific research*—392
- Dyke, W. P., J. K. Trolan, W. W. Dolan, E. E. Martin, and J. P. Barbour. On the field emission initiated vacuum arc—497(A)
- Edwards, Donald A. Physics in negro colleges—a progress report 658(A), 691
- Efron, Alexander. Review of *Selected science teaching ideas of 1952*—695
- Eisenstein, Albert S. Review of *Photoelectric tubes*—697
- Elder, F. Kingsley, Jr. Review of *Thermal diffusion in gases*—477
- Elmore, William C. Undergraduate electron diffraction experiment—407(A)
- Eppenstein, Walter. Course in laboratory and shop processes for physics majors—406(A)
- Geiger-Müller counter in the general physics laboratory—657(A)
- Erickson, Willard L. Standard cells for a general physics laboratory—495(A)
- Fein, Elihu. Complementarity in the life sciences—141(L)
- Feldman, Richard L. *Journal* misses the mark—475(L)
- Ferigle, Salvador and Alfons Weber. Eckart conditions for a polyatomic molecule—102
- Fields, T. (see Burk, D.)—401(A)
- Fields, T. H. (see Burk, D. L.)—657(A)
- Fitzsimmons, K. E. Method of determining the heats of sublimation of low vapor pressure solids—497(A)
- Forster, George. Education?—or merely training? XI Swivel-chair or pipe-dream laboratory techniques—239(A)
- Francis, Norman C. and Kenneth M. Watson. Interaction of  $\pi$  mesons with atomic nuclei—659
- Freeman, Ira M. Potentialities of the introductory physics course in developing mathematical intuition—403(A)
- Review of *Impact of science on society*—148
- Fretter, William B. Review of *High-energy particles*—236
- Gale, Grant O. Striations in electromagnetic stationary waves—389
- Gates, David M. Review of *Proceedings of the London Conference on Optical Instruments 1950*—145
- Geballe, R. (see Burch, D. S.)—497(A), 570
- Germann, L. S. Experiments that might be performed with accelerators in the 10 to 100-Bev range—498(A)
- Ginn, Archie and Charles G. Miller. Construction and utilization of a continuous diffusion cloud chamber in the advanced undergraduate laboratory—500(A)
- Goldowski, N. Is it possible to teach physics to humanities students?—493(A)
- Goldstein, Herbert. Bohr formula for nonrelativistic elliptic orbits—688
- Green, Alex E. S. Review of *Nuclear stability rules*—395
- Green, Robert B. New examination of the laws of thermodynamics—658(A)
- Greenbaum, Bernard A. (see Blisard, Thomas J.)—109
- Guent, P. G. and Wendell M. Simmons. Experiment on cosmic rays—357
- Haden, Harley. Hydraulic conductivity—499(A)
- Haisley, W. E. Use of mnemonics in physics teaching—405(A)
- Hall, L. H. Longitudinal vibrations of a vertical column by the method of Laplace transform—287
- Hammond, Albert L. Review of *Symbolic logic, an introduction*—237
- Hammond, H. E. Exciting a Kundt's tube with a siren—475(L)
- Hanau, Richard. Meetings of Kentucky Section—238, 494, 498
- Review of *Introduction to geometrical and physical optics*—696
- Unified treatment of prisms and gratings—494(A)
- Hanson, Howard G. Heat of sublimation of sodium iodide—584(A)
- Happ, W. W. Experiment in teaching: incomplete symmetry of physical systems—453
- Harrington, E. L. Review of *Physics and medicine of the upper atmosphere*—319
- Hartel, Lawrence W. Mathematics requirements for our general physics courses—496(A)
- Hein, Richard E. (see McFarland, Robert H.)—325
- Heine-Geldern, R. V. Kerr cell photography at exposures shorter than one microsecond—657(A)
- Heller, Ralph (see Slonczewski, John C.)—313
- Henke, Burton. Project approach for the elementary laboratory, II—239(A)
- Henshaw, Clement L. Review of *General education in science*—147
- Herzog, Fritz. Review of *Calculus—a modern approach*—398
- Heverly, J. Ross. Meetings of the Chesapeake Section—704
- Hickman, Kenneth. Review of *Industrial high vacuum*—68
- Hill, E. L. Review of *Introduction to theoretical physics*—480
- Hill, Harry (see Bell, Raymond M.)—389
- Hilton, Wallace A. Demonstration models of retardation plates in polarized light—466
- Hirsch, Lester. Meeting of the Southern California Section—499
- Hirah, Merle N. Decade scaler using neon tubes—73(A)
- Hitchcock, Richard C. Meeting of the Western Pennsylvania Section—400
- Oscilloscope pictures of intermodulation distortion—657(A)
- Science is fun at the Buhl Planetarium—73(A)
- Hitschfeld, Walter. Review of *A university text-book of physics, Volume III, heat*—320
- Hollier, R. N. and Otto Laporte. Parameters characterizing the strength of a shockwave—610
- Holm, Gustave R. Definitions of electromagnetic units—472(L)
- Houston, W. V. Review of *Mechanics, lectures on theoretical physics*—399
- Hrones, John A. Physics for engineers—565
- Hudson, G. E. Trend analysis of physical data—362
- Hughes, J. V. Definitions of magnetic flux density and field intensity—89
- Discussion concerning "Definitions of magnetic quantities"—648(L)
- Possible motions of a sphere suspended on a string (the simple pendulum)—47
- Hulbert, Edward O. Review of *Radio astronomy*—236
- Hull, M., Jr. (see Breit, G.)—184
- Hunt, R. Allen. Higher modes of oscillation of a uniform chain—465
- Hutchisson, Elmer. Some thoughts on the educational process—532
- Ikenberry, Ernest (see Besdin, D. J.)—418
- Ingersoll, Leonard R. Modern applications of an old theory—321(A)
- Ions, Mario. Units of mass and force—496(A)
- Irons, Eric J. Graphical solutions to optical problems of three different types—1
- Some generalizations in geometrical optics derived by a convergence method—590
- Jacobs, Stephen F. Self-centered shadow—234(L)
- Jehle, Herbert and Julius H. Cahn. Anharmonic resonance—526
- Jensen, E. N. Review of *Physics for science and engineering students*—697
- Jensen, Harald C. Modified Barlow's wheel—692
- Johnson, A. Frances (see Railsback, O. L.)—321
- Kaplan, H. (see Keffer, F.)—250
- Katz, H. W. Concerning definitions of magnetic quantities—647(L)
- Katz, Robert. Group-phase velocity demonstrator—388
- Keffer, F., H. Kaplan, and Y. Yafet. Spin waves in ferromagnetic and antiferromagnetic materials—250

- Keffer, Frederic.** Demonstrations with the Bragg model of a crystal lattice—657(A)
- Kelly, W. C.** Meeting of Western Pennsylvania Section—73  
—Proceedings of the American Association of Physics Teachers, Pittsburgh Meeting, June 25-27, 1953—654  
—Program to inform high school students about opportunities in physics—404(A)
- Kikuchi, C.** (see Van Ostenburg, D.)—574
- Kikuchi, Chihiro.** Review of *The classical theory of fields*—392
- King, Allen L.** Note in memory of blind John Gough—231
- Klein, Martin J.** Review of *Mechanics and properties of matter*—71
- Klema, E. D., R. J. Stephenson, and S. Taylor.** Experimental reactor physics course at the Oak Ridge School of Reactor Technology—300
- Klemensiewicz, Z.** Some remarks on D. Bernoulli's formula—144(L)
- Kline, John V.** Method of presenting centrifugal force to sophomore students—496(A)
- Knight, Bruce W., Jr.** Canonical field theory—a prototype example—421
- Kofaky, Irving L.** Crystal diodes in the electronics laboratory—159(A)  
—Exterior ballistics—233(L)
- Kolin, Alexander.** Demonstration of parabolic velocity distribution in laminar flow—619  
—Demonstration of the velocity distribution in laminar flow—409(A)
- Kolossvary, Bela G.** Reflection method of surface tension measurement—510  
—Three lecture room demonstrations in the field of electricity—228
- Koppe, H.** Quantum radiation of a given current—548
- Kothari, L. S.** Application of Dirac's  $\delta$ -function to some problems in classical physics—99  
—Motion of a particle across a potential jump—468
- Kraitchman, J.** Determination of molecular structure from microwave spectroscopic data—17
- Kruglak, Haym.** Achievement of physics students with and without laboratory work—14  
—Kirchhoff's radiation law demonstrations—466
- Kuerti, G.** On the derivation of the principle of angular momentum about the mass center—469
- Kunz, P. D.** Noncommutative property of the quantum-mechanical angular momentum operator by vector methods—497(A)
- Lane, C. T.** Review of *Low temperature physics*—146
- Laporte, Otto** (see Hollyer, R. N.)—610
- Lari, Robert J.** (see Shonka, William J.)—467
- Leaf, Boris and A. B. Cardwell.** Review of *An introduction to thermodynamics, the kinetic theory of gases, and statistical mechanics*—580
- LeCorbeiller, P.** Three new formulations of Newton's laws—403(A)
- Lenzen, V. F.** Review of *The nature of some of our physical concepts*—71
- Long, V. Allan.** Electrical well logging—496(A)
- Lovell, Donald J.** Concept of radiation measurements—409(A), 459
- Mackay, R. Stuart.** Coupled electrical mechanical oscillatory systems—575  
—Sustained Foucault pendulums—180
- Majumdar, K. and Mahendra Singh Sodha.** On the resolving power of a prism—387
- Martin, Alfred E.** Electroluminescence of phosphors—409(A)
- Martin, Donald C.** Graduate training for high school physics teachers and cooperation between college and high school physics departments—494(A)  
—Need for more and better trained high school physics teachers—390(L)  
—Training of high school physics teachers and cooperation between college physics departments and high schools—614
- Martin, E. E.** (see Dyke, W. P.)—497(A)
- Masket, A. Victor.** Elementary theory of neutron sources in reactors—151
- Maupin, Robert and E. E. Mayo.** Pseudo-standing waves in an infinite medium—498(A)
- Mayo, E. E.** Dielectric lens—494(A)  
—(see Maupin, Robert)—498(A)
- McCay, M. S.** (see Morrison, Ray M.)—494(A)
- McConnell, R. A.** Resolving time of a binary counter: a laboratory exercise—585
- McDaniel, B. D.** Intermediate laboratory experiments at Cornell University—406(A)
- McDaniel, Boyce D.** Experiment in mechanical resonance vibrations—551
- McFarland, Robert H. and Richard E. Hein.** Course in radioactive determinations—325
- Meijer, Robert R.** Experiment on Maxwellian velocity distribution of electrons—407(A)
- Meinke, W. W.** (see Nehemias, John V.)—405(A)
- Mentser, Morris** (see Cohn, Ernst M.)—681
- Mercer, Derwent M. A.** Physics of the organ flue pipe—376
- Michels, Walter C. and Eva Wiener.** Undergraduate experiment for the determination of alpha-particle range—307  
—(see Cuff, William A.)—475(L)
- Michener, W. H.** Discussion of the report of the Coulomb's Law Committee of the AAPT—73(A)
- Miller, Charles G.** Short method for the evaluation of Meek's equation for sparking potentials—500(A)  
—(see Ginn, Archie)—500(A)
- Miller, Jack C.** Place of theoretical physics in the undergraduate curriculum—239(A)
- Miller, Julius Sumner.** Behavior of a flat whisky bottle when heated—64(L)  
—Concerning the electric charge on a moving vehicle—316(L)  
—Device for physics open-house—233(L)  
—Extension of the conical pendulum problem and its demonstration—315(L)  
—Further demonstrations in analytical mechanics—143(L)  
—New type quiz questions in physics—404(A)  
—Observations on the smoke trail of a sky-writer—391(L)  
—On an aspect of demonstration experiments—144(L)  
—On the use of dimensional analysis—578(L)  
—Sinusoidal representation of harmonic motion—an introductory demonstration—232(L)  
—Two interesting problems and a proposal for stimulating young physics teachers and for inducing them to remain in teaching—240(A)
- Mitchell, F. H.** Experiment with transistors for the elementary electronics laboratory course—493(A)
- Mitchell, John and C. E. Adams.** Photoelastic studies of sound waves in liquids—499(A)
- Mittler, Henri.** On the linearization of a relativistic Hamiltonian—473(L)
- Motz, H. and L. I. Schiff.** Čerenkov radiation in a dispersive medium—258
- Munick, Raymond J.** Theory of mechanical electrometers—512
- Muñiz, Eddie Ortiz.** Computation of the moment of inertia of various bodies by the approximate sum of numerical series—11  
—Method for deriving various formulas in electrostatics and electromagnetism using Lagrange's trigonometric identities—140  
—Set-up for the vibrating wire experiment—232
- Morrison, Ray M. and M. S. McCay.** Incentive grading for the basic laboratory reports—494(A)
- Murray, Raymond L.** (see Beck, Clifford)—396
- Murtaugh, W. A.** Trigonometry before physics?—317(L)
- Nehemias, John V., L. E. Brownell, W. W. Meinke, and E. W. Coleman.** Installation and operation of ten-kilocurie cobalt-60 gamma-radiation source—405(A)
- Neher, H. V.** Review of *Cloud chamber photographs of the cosmic radiation*—234
- Oberman, Carl** (see Amar, Henri)—518
- O'Connell, Walter.** Root phenomena: knots, flames, faucet drips, etc. (including barber poles)—499(A)
- Odgers, G. J.** Review of *Stars in the making*—481
- Oetjen, Robert A. and John N. Cooper.** New physics building at the Ohio State University—221
- Okress, Ernest C.** Physics of microwave calorimeters—330
- Osgood, Thomas H.** Practical aids for physics teachers—266, 386, 680  
—Report of the editor for the year 1952—487  
—To secretaries of regional sections of AAPT—286
- Palmer, R. Ronald.** Proceedings of the American Association of Physics Teachers, Cambridge Meeting, January 22-24, 1953—401
- Park, David.** Review of *Methods of applied mathematics*—480



- Scattering theory—a second note—540
- Parsons, K. A. Exciting a Kundt's tube with a siren—392(L)
- Paton, R. F. Minutes of the meeting of the Council held in Cambridge, Massachusetts, January 22, 1953—489
- Patterson, Chalmers N. What can we do for the less-than-mediocre students now crowding our colleges?—322(A)
- Payne, Mary H. Review of *Vector analysis*—149
- Payne, W. T. Geometric approach to nonrelativistic spin theory—621
- Peach, Milton O. Remarks concerning the paper "Conditions for the derivation of the stress deviator tensor"—64(L)
- Peck, R. A. Jr. (see Raney, W. P.)—405(A)
- Petry, Frank. Curb feelers and physics—499(A)
- Phillips, Theodore G. Meeting of the Chicago Section—400
- Pippert, Glen and Duane Roller. Making the laboratory a more effective scientific experience—617
- Plaisted, William E. Intermediate laboratory physics—methods and aims at the University of Rhode Island—405(A)
- Pollara, Frank Z. (see Pollara, Luigi Z.)—387
- Pollara, Luigi Z. and Frank Z. Pollara. Ideal gas equation—387
- Pollard, William G. Complementarity in the life sciences—142(L)
- Pollock, Ray (see Saunders, Norman)—496(A)
- Pomeroy, David. Teaching of biophysics—493(A)
- Pong, William. Principal frequencies of a double spring-mass system—546
- Poplawsky, Robert P. (see Symon, Keith R.)—53
- Preston, W. M. Meeting of American Physical Society, New England Section—150
- Proschan, Frank. Rejection of outlying observations—520
- Pryor, Marvin J. Presenting virtual objects by demonstration and a graph to present real objects and images—408(A)
- Purbrick, R. L. Construction of a diffraction grating spectrograph—241
- Railsback, O. L. and A. Frances Johnson. Meeting of Illinois Section—321
- Raney, W. P. and R. A. Peck, Jr. Use of the group experiment in preliminary stages of laboratory instruction in elementary physics—405(A)
- Randall, Robert H. Demonstration of the Doppler effect—407(A)
- Raudorf, Walter R. Particle properties of radiant energy in wave guides—25, 693(L)
- Reid, Walter P. Steady-state shape of a wire cutting a uniform medium—640
- Reithel, R. J. County rotation plan for high school physics laboratories—495(A)
- Resnick, Robert. Dynamic coefficient of friction experiment—400(A)
- Rhodes, J. Elmer, Jr. Analysis and synthesis of optical images—337; Erratum—427
- Heat transfer to a boiling liquid—67(L)
- Radiation pressure against perfect reflectors—683
- Riggs, Cecil O. Wanted: Generic term for a class of units—73(A)
- Riggs, Philip S. Review of *The astronomical universe*—69
- Rigney, Carl J. Operational approach for the classroom development of basic concepts and Newton's laws—322(A)
- Rinehart, John S. Surface energy, a mode for energy absorption during impact—305
- Ritchie, Earland. Binary programs in liberal arts colleges—495(A)
- Robinson, Berol L. Concerning the frequencies resulting from distortion—391(L)
- Robinson, Donald D. Demonstration of the two wavelength method of focussing by diffraction—499(A)
- Robinson, Lawrence B. and Edgar M. Cole. Experiment involving the determination of the half-life of an isotope—469
- Rochow, E. G. Coordinated program for teachers of chemistry and physics—559
- Rogers, Eric M. Demonstration experiments—408(A)
- Roller, Duane. Proposed procedure for selecting and using symbols for physical units—293
- and Duane H. D. Roller. On the history of electricity prior to 1600—409(A)
- and Duane H. D. Roller. Prenatal history of electrical science—343
- (see Pippert, Glen)—617
- Roller, Duane H. D. (see Roller, Duane)—343, 409(A)
- Rose, M. E. Review of *Elements of wave mechanics*—70
- Rosen, Nathan. Review of *The theory of relativity*—148
- Ruark, Arthur E. Classical neutron model—493(A)
- Rudnick, Isadore. Review of *Principles of modern acoustics*—695
- Rusk, Rogers D. Review of *Symmetry*—72
- Sartain, Carl C. Electrolysis of water: an experiment in atomic physics—493(A)
- Magnitude of the newton—144(L)
- Satterly, John. Expansion of an oval bottle—471(L)
- Experiments with a bottle of oval cross section—470(L)
- Rocking experiment with two degrees of freedom—267
- Saunders, Norman, Ray Pollock, and A. A. Bartlett. Student experiment on the latent heat of vaporization of electrons—496(A)
- Schenck, Hilbert, Jr. Physics and physiology in diving decompression—277
- Schiff, L. I. (see Motz, H.)—258
- Sears, Francis W. Report of the taserer—488
- Seeger, R. J. Fluid dynamics in physics teaching—29
- Shaw, Robert S. Review of *The atom story*—482
- Sherburne, R. K. and W. L. Weeks. Momentum thrust of a rocket—139
- Shewell, J. R. (see Beadin, D. J.)—418
- Shonka, William J. and Robert J. Lari. Transients in L-C networks—467
- Simmons, Wendell M. (see Guest, P. G.)—357
- Simon, A. W. On a routine analytic method for the solution of problems in statics—244
- Sleator, W. W. Elimination of variables in the Biot equation—692
- Slonczewski, John C. and Ralph Heller. Determination of the coefficient of surface tension by the bubble-length method—313
- Smith, T. Townsend. Constant battery Wheatstone bridge—247
- Sodha, Mahendra Singh. Effect of absorption by the material of the prism on its resolving power—313
- (see Majumdar, K.)—387
- Spencer, Domina Eberle. Interpretation of the Ampère experiments—409(A)
- Squire, C. F. Review of *Theory of superconductivity*—145
- Steadman, F. M. Steadman convergence figure of light intensity—409(A)
- Stein, Irving. Clarification of some elementary concepts in electricity and magnetism—693(L)
- Stephenson, R. J. Review of *Advanced mathematics in physics and engineering*—478
- (see Klema, E. D.)—300
- Stern, Alexander W. Some concepts in modern physics—629
- Stinchcomb, T. G. Use of a large liquid scintillation counter to detect cosmic ray showers—498(A)
- Sultanoff, M. Review of *High speed photography—its principles and applications*—478
- Sutton, Richard M. Experimental encounter with bifilar pendula—408(A)
- Heritage of a physics teacher—369
- Some teasers for conclusion jumpers—658(A)
- Swann, W. F. G. Leigh Page—483
- Symon, Keith R. and Robert P. Poplawsky. Electronic differential analyzer—53
- Takeo, Makoto. Theory of fine structure pressure broadening—497(A)
- Taylor, S. (see Klema, E. D.)—300
- Therese, Sister Mary. Scientific womanpower—our country's need and what women's colleges are doing to supply physicists—404(A), 569
- Thomsen, John S. Coulomb friction with several blocks—446
- Traub, Alan C. Graphical demonstration of white light interference—75
- Trolan, J. K. (see Dyke, W. P.)—497(A)
- Tuan, Render. Wanted: Apparatus for college physics laboratory experiments—474(L)
- Tyndall, John. Electrification of a glass rod—578(L)
- Van Ostenburg, D. and C. Kikuchi. Some analogies of the tippe top to electrons and nuclei—574
- Varnum, Edward C. Adding two distributions—321(A)
- Verbrugge, Frank. Dynamic model of magnetic resonance phenomena—603
- Some quantitative experiments with the magnetic top—407(A)

- Waage, Harold M.** Projection thermometer for lecture demonstrations—465
- Wadey, Walter G.** Electrical equipment for physics lecture demonstrations—503
- Wahlin, H. B.** Review of *Heat transfer phenomena*—394
- Wangness, Roald K.** Geometrical solution for a nuclear moment in a magnetic field—274
- Wanta, R. C.** Self-centered shadow—578(L)
- Warburton, F. W.** Illustrating magnetization and gyromagnetism—499(A)
- (see Baez, Albert V.)—499(A)
- Watson, E. C.** Reproductions of prints, drawings, and paintings of interest in the history of physics. 50. Fluents and fluxions—51; 51. Caricature of Sir John Leslie—107; 52. Frontispiece and Vignette from Chérubin's *La dioptrique oculaire*—162; 53. Photograph of H. A. Lorentz, H. Kamerlingh Onnes, Niels Bohr, and Paul Ehrenfest—463; 54. Invention of spectacles—555; 55. Titlepage from Robert Grosseteste's *Lines, angles and figures*—642; 56. Four Plates from *A complete system of optics* by Robert Smith—673
- Watson, Kenneth M.** (see Francis, Norman C.)—659
- Weber, Alfons** (see Ferigle, Salvador)—102
- Weber, Harold C.** Physics for nonphysics majors in chemical engineering—563
- Weber, Louis R.** Improvisations—703
- Weber, Robert L.** Review of *Fundamentals of thermometry*—582
- Review of *Practical thermometry*—582
- Weeks, W. L.** (see Sherburne, R. K.)—139
- Weinberg, Izabella Goldin and J. M. Blatt.** Uniform model of the nucleus—124
- Whyte, L. L.** Dimensional theory: dimensionless secondary quantities—323
- Wiener, Eva** (see Michels, Walter C.)—307
- Wilks, William T.** Unit test on light for college course in general physics—652
- Williams, E. Allan.** Electronics in a sophomore physics course—373
- Use of transistors, dielectric amplifiers, and magnetic amplifiers as a means of motivation—499(A)
- Williamson, Charles.** Demonstration of subjective harmonics—316(L)
- Williamson, Chas.** Frequencies resulting from distortion—68(L)
- Projects in advanced electricity for undergraduate students—406(A)
- Projects in electricity for upperclass undergraduate students in physics—567
- Winans, J. G.** Book and sound records of scientific meetings—405(A)
- Demonstrations with half-wave plates—170
- Doppler effect equation—658(A)
- Wolterink, L. F.** Review of *Radiations and living cells*—650
- Woods, Robert M.** Demonstration of Ohm's law and simple dc circuits—401(A)
- Worrell, Francis T.** Laboratory experiment on the dielectric constant of gases—407(A)
- Teaching a philosophy of experimentation in a course in electrical measurements—296
- Worth, Donald C.** Modern physics laboratory course involving construction techniques—239(A)
- Wright, Winthrop R.** Tapered-film interference filter—406(A)
- Wyman, M. E.** Membranes showing cation and anion inhibitory mechanisms—584(A)
- Yafet, Y.** (see Keffer, F.)—250
- Yeager, Ernest.** Review of *Ultrasonic physics*—69
- Young, Otis B.** Individual projects on the intermediate level as a training aid and as an economy measure—573
- Younger, Philip.** Hall effect as a laboratory experiment—584(A)
- Meeting of the Minnesota Section—584
- Zemansky, Mark W.** Presentation of Oersted award to Professor Richard M. Sutton—368
- , Chairman. Report of the Committee on Awards—410
- Zieman, Clayton M.** Classroom antenna experiment—97
- Zwicky, F.** Review of *Sir James Jeans*—477

### Analytic Subject Index to Volume 21

The titles of articles are disregarded, the entries being based on analyses of the contents of the articles. The symbol (A) designates an abstract of a paper read at a meeting; (T) designates title only, and (L) designates a Letter to the Editor.

To facilitate reference to any desired subject, this index is divided into sections arranged alphabetically. The titles of these sections are as follows:

- |                                                        |                                           |                                    |
|--------------------------------------------------------|-------------------------------------------|------------------------------------|
| Accelerators                                           | General education                         | Nuclear physics                    |
| Aerophysics                                            | General physics, educational aspects      | Philosophy of science              |
| American Association of Physics Teachers               | General physics, instructional techniques | Photography                        |
| American Physical Society                              | Geophysics                                | Properties of matter               |
| Apparatus                                              | Heat and thermodynamics                   | Radio and television               |
| Astrophysics                                           | History and biography                     | Relativity                         |
| Biophysics                                             | Laboratory arts and techniques            | Reports, announcements, and news   |
| Cosmic rays                                            | Laboratory organization                   | Rockets                            |
| Cosmography                                            | Language                                  | Secondary-school physics           |
| Courses                                                | Light                                     | Sound                              |
| Demonstrations                                         | Mathematics                               | Teacher training                   |
| Department administration, maintenance, and activities | Mechanics, classical                      | Testing, theory and techniques     |
| Education, physics and science                         | Mechanics, quantum                        | Textbooks                          |
| Electricity and magnetism                              | Mesons                                    | Units, dimensions, and terminology |
| Employment of physicists                               | Microwaves                                | Visual materials and methods       |
| Experiments                                            | Military applications of physics          | X-rays                             |
|                                                        | Modern physics                            |                                    |
- 
- Accelerators**
- Design considerations for very high energy accelerators, M. S. Livingston—150(T)
- Experiments that might be performed with accelerators in the 10 to 100-Bev range, L. S. Germain—498(A)
- Operating principles of synchrotron accelerators, I. S. Blumenthal—164
- Aerophysics**
- Microwave measurement of variations in the atmospheric index of refraction, George Birnbaum—705(T)

**American Association of Physics Teachers**

- Activities and publications of AAPT, William A. Cuff and Walter C. Michels—475(L)
- Committee members—492
- Discussion of the report of the Coulomb's Law Committee of the AAPT, W. H. Michener—73(A)
- Journal* misses the mark, Richard L. Feldman—475(L)
- Meeting at Cambridge, January 22-24, 1953; program and abstracts, R. Ronald Palmer—401
- Meeting at Pittsburgh, June 25-27, 1953: announcements—309, 356; program and abstracts, W. C. Kelly—654
- Minutes of the meeting of the Council held in Cambridge, Massachusetts, January 22, 1953, R. F. Paton—489
- Necrology: Leigh Page, 1884-1952, W. F. G. Swann—483
- New members of the Association—72, 238, 399, 485, 654, 704
- Presentation of Oersted award to Professor Richard M. Sutton, Mark W. Zemansky—368; Heritage of a physics teacher, Richard M. Sutton, 369, 403(T)
- Report of Editor for the year 1952, Thomas H. Osgood—487
- Report of the Committee on Awards, M. W. Zemansky, Chairman—410
- Report of the treasurer, Francis W. Sears—488
- Section news: Chicago, Theodore G. Phillips—400; Chesapeake, J. Ross Heverly—704; Colorado-Wyoming, Albert A. Bartlett—495; Illinois, O. L. Railsback and A. Frances Johnson—321; Indiana, announcement—257; Kentucky, Richard Hanau—238, 494, 498; Minnesota, Philip Youngner—584; Oregon, Kenneth E. Davis—497; Southern California, David F. Bender—239, Lester Hirsch—499; Western Pennsylvania, W. C. Kelly—73, Richard C. Hitchcock—400; Wisconsin, announcement—249
- Tape recordings of important speeches—50, 150, 227, 276, 458, 558, 613
- Tape recordings of Pittsburgh Meeting of AAPT—417
- Taylor Memorial Laboratory Manual, T. B. Brown, Chairman—487, 564
- To secretaries of regional sections of AAPT, Thomas H. Osgood—286

**American Physical Society**

- Section news: New England, W. M. Preston—150; Southeastern, Dixon Callihan—492
- Two phenomena of inversion, address of the retiring president of the APS, J. H. Van Vleck—403(T)

**Apparatus**

- Analog computer of the National Bureau of Standards, Erwin Hoffer—499(T)
- Audible repeating time signal device, T. G. Bullen—645
- Binary counter, laboratory exercise on resolving time of, R. A. McConnell—585
- Construction and utilization of a continuous diffusion cloud chamber in the advanced undergraduate laboratory, Archie Ginn and Charles G. Miller—500(A)
- Construction of a diffraction grating spectrograph, R. L. Purbrick—241
- Decade scaler using neon tubes, Merle N. Hirsch—73(A)
- Dielectric lens, E. E. Mayo—494(A)
- Dynamic model of magnetic resonance phenomena, Frank Verbrugge—603
- Echo ranging with audiofrequencies, George Bradley—159
- Electrical equipment for physics lecture demonstrations, Walter G. Wadey—503
- Electronic differential analyzer, Keith R. Symon and Robert P. Poplawsky—53
- Extrapolation chamber for determining beta-ray surface-dosage rates, John M. Brabant—238(A)
- Geiger-Müller counter in the general physics laboratory, Walter Eppenstein—657(A)
- Graphical demonstration of white light interference, Alan C. Traub—75
- Kerr cell photography at exposures shorter than one microsecond, R. V. Heine-Geldern—657(A)
- Kundt's tube projection demonstration, Albert V. Baez—64(L)
- Low-pressure ultrasonic condenser microphone, Carl E. Adams—238(T)

Magnetic tape recorder as a teaching aid in physics, Albert V. Baez and F. W. Warburton—499(A)

- Mechanical electrometers, theory of, Raymond J. Munick—512
- Modified Barlow's wheel, Harald C. Jensen—692
- Muller microscope, Bernard L. Brinker—74(A)
- Note on the design of the spherometer, Henry S. C. Chen—658(A)
- Projection oscilloscope, D. L. Burk and T. H. Fields—401(A), 657(A)
- Projection thermometer for lecture demonstrations, Harold M. Waage—465
- Set-up for the vibrating wire experiment, Eddie Ortiz Muñiz—232
- Simple apparatus for central force investigations in an advanced undergraduate laboratory, Stephen Berko—407(A)
- Small magnetron, Thomas B. Brown—705(T)
- Small scale dc motor experiment for the elementary laboratory, Grover C. Baker and George E. Bradley—689
- Some optical filters, Nora Mohler—150(T)
- Standard cells for a general physics laboratory, Willard L. Erickson—495(A)
- Three lecture room demonstrations in the field of electricity, Bela G. Kolossvary—228
- Ultrasonic interferometer as a screw calibrating instrument, Romard Barthel—316(L)
- Undergraduate experiment for the determination of alpha-particle range, Walter C. Michels and Eva Wiener—307
- Use of a large liquid scintillation counter to detect cosmic ray showers, T. G. Stinchcomb—498(A)
- Use of transistors, dielectric amplifiers, and magnetic amplifiers as a means of motivation, E. Allan Williams—499(A)
- Wanted: apparatus for college physics laboratory experiments, Render Tuan—474(L)
- Zeiss planetarium projector, Arthur L. Draper—401(A)

**Astrophysics**

- Past and future of the sun, George Gamow—704(T)

**Biophysics**

- Applications of physics to medical research problems, Martin Hanig—656(T)
- Physics and physiology in diving decompression, Hilbert Schenck, Jr.—277
- Physics in physiology, Paul L. McLain—656(T)
- Teaching of biophysics, David Pomeroy—493(A)

**Cosmic rays**

- Experiment on cosmic rays, P. G. Guest and Wendell M. Simmons—357
- New particles in cosmic rays, R. W. Williams—150(T)
- Use of a large liquid scintillation counter to detect cosmic ray showers, T. G. Stinchcomb—498(A)

**Cosmography**

- Steady-state theory, H. Bondi—304

**Courses**

- Curriculum modifications proposed in the field of physics, Richard M. Sutton—657(T)
- Electromagnetic radiation, course for seniors in, C. Sharp Cook—542
- Electronics in a sophomore physics course, E. Allan Williams—373
- Experimental reactor physics course at the Oak Ridge School of Reactor Technology, E. D. Klema, R. J. Stephenson, and S. Taylor—300
- Intermediate laboratory physics—methods and aims at the University of Rhode Island, William E. Plaisted—405(A)
- Laboratory and shop processes for physics majors, course in, Walter Eppenstein—406(A)
- Modern physics laboratory course involving construction techniques, Donald C. Worth—239(A)
- Place of theoretical physics in the undergraduate curriculum, Jack C. Miller—239(A)
- Premedical courses in physics—advantages and present trends, E. L. Harrington—656(T)
- Radioactive determinations, course in, Robert H. McFarland and Richard E. Hein—325
- Teaching a philosophy of experimentation in a course in electrical measurements, Francis T. Worrell—296
- Undergraduate course in research techniques, S. C. Brown—403(T)

**Demonstrations**

- Analytical mechanics, demonstrations in, Julius Sumner Miller—143(L)  
 Behavior of a flat whisky bottle when heated, Julius Sumner Miller—64(L)  
 Bragg method demonstrated with sound waves, George Barnes—688  
 Bragg model of a crystal lattice, demonstrations with, Frederic Keffer—657(A)  
 Data for student computation in electricity, demonstrations to provide, Thomas J. Blisard and Bernard A. Greenbaum—109  
 Demonstration experiments, Eric M. Rogers—408(A)  
 Device for physics open-house, Julius Sumner Miller—233(L)  
 Doppler effect, demonstration of, Robert H. Randall—407(A)  
 Echo ranging with audiofrequencies, George Bradley—159  
 Electrical equipment for physics lecture demonstrations, Walter G. Wadey—503  
 Electrification of a glass rod, John Tyndall—578  
 Electroluminescence in phosphors, Alfred E. Martin—409(A)  
 Entertaining demonstration using window glass as a mirror, Albert V. Baez—63  
 Exciting a Kundt's tube with a siren, K. A. Parsons—392(L); H. E. Hammond—475(L)  
 Expansion of an oval bottle, John Satterly—471(L)  
 Experiments with a bottle of oval cross-section, John Satterly—470(L)  
 Extension of the conical pendulum problem and its demonstration, Julius Sumner Miller—315(L)  
 Graphical demonstration of white light interference, Alan C. Traub—75  
 Group-phase velocity demonstrator, Robert Katz—388  
 Half-wave plates, demonstrations with, J. G. Winans—170  
 Illustrating magnetization and gyromagnetism, F. W. Warburton—499(A)  
 Kirchhoff's radiation law demonstrations, Haym Kruglak—466  
 Kundt's tube projection demonstration, Albert V. Baez—64(L)  
 Modified Barlow's wheel, Harald C. Jensen—692  
 New lecture room facilities and demonstrations, Gerald J. Holton—403(T)  
 Ohm's law and simple dc circuits, demonstration of, Robert M. Woods—401(A)  
 On an aspect of demonstration experiments, Julius Sumner Miller—144(L)  
 Parabolic velocity distribution in laminar flow, demonstration of, Alexander Kolin—409(A), 619  
 Presenting virtual objects by demonstration and a graph to present real objects and images, Marvin J. Pryor—408(A)  
 Projection oscilloscope, D. L. Burk and T. H. Fields—401(A), 657(A)  
 Projection thermometer for lecture demonstrations, Harold M. Waage—465  
 Retardation plates in polarized light, demonstration models of, Wallace A. Hilton—466  
 Sinusoidal representation of harmonic motion—an introductory demonstration, Julius Sumner Miller—232(L)  
 Star of Bethlehem—401(A)  
 Striations in electromagnetic stationary waves, Grant O. Gale—389  
 Subjective harmonics, demonstration of, Charles Williamson—316(L)  
 Sustained Foucault pendulums, R. Stuart Mackay—180  
 Three lecture room demonstrations in the field of electricity, Bela G. Kolosvary—228  
 Try it and think, Richard M. Sutton—400(T)  
 Two-wavelength method of focussing by diffraction, demonstration of, Donald D. Robinson—499(A)  
 Zeiss planetarium projector, Arthur L. Draper—401(A)
- Department administration, maintenance, and activities**  
 Administrative problems and arrangements, Morris Meister—657(T)  
 Admission with advanced standing, study of, William H. Cornog—657(T)  
 Cornell University, intermediate laboratory experiments at, B. D. McDaniel—406(A)  
 New Physics Building at the Ohio State University, Robert A. Oetjen and John N. Cooper—221  
 Physics in Negro colleges—a progress report, D. A. Edwards—658(A), 691

University of Rhode Island, intermediate laboratory physics at, William E. Plaisted—405(A)

**Education, physics and science**

- Avenues of cooperation between physics and the engineering college, G. P. Brewington—404(A)  
 Binary programs in liberal arts colleges, Earland Ritchie—495(A)  
 College entrance requirements in mathematics and physics, John Daniels—656(T)  
 Cooperation between college physics departments and high schools, Donald C. Martin—614  
 Coordinated program for teachers of chemistry and physics, E. G. Rochow—559  
 Education for physics in Spain, Salvador Ferigle—400(T)  
 Getting qualified students into physics, Mary E. Batiste, Jastro Levin, and John S. Thomsen—704(T)  
 Heritage of a physics teacher, Richard M. Sutton—369, 403(T)  
 Individual projects on the intermediate level as a training aid and as economy measure, Otis B. Young—573  
 Is it possible to teach physics to humanities students? N. Goldowski—493(A)  
 My experiences teaching physics in Indonesia, Sybrand Broersma—400(T)  
 Need and place of a foreign language for a physics major or an engineer, Earland Ritchie—239(T)  
 Philosophy and objectives of the study of admission with advanced standing, William H. Cornog—657(T)  
 Physics beyond general physics for nonphysics majors, Joseph H. Keenan, presiding, E. G. Rochow, R. B. Adler, H. C. Weber, J. A. Hrones—403(T)  
 Physics for engineers, John A. Hrones—565  
 Physics for nonphysics majors in chemical engineering, Harold C. Weber—563  
 Physics for students of electrical communication, R. B. Adler—560  
 Physics in negro colleges. a progress report, Donald A. Edwards—658(A), 691  
 Physics in the liberal arts college, T. D. Phillips—656(T)  
 Physics teaching in Baghdad, Albert B. Baez—239(A)  
 Place of theoretical physics in the undergraduate curriculum, Jack C. Miller—239(A)  
 Root phenomena: knots, flames, faucet drips, etc. (including barber poles), Walter O'Connell—499(A)  
 Science, art, and education, R. E. Gibson—656(T)  
 Scientific womanpower—our country's need and what women's colleges are doing to supply physicists, Sister Mary Therese—404(A), 569  
 Some thoughts on the educational process, Elmer Hutchisson—403(T), 532  
 Stimulation of interest in physics, Harold F. Bernhardt—656(T)  
 Teaching a philosophy of experimentation in a course in electrical measurements, Francis T. Worrell—296  
 Teaching physics 1900 to 1906, W. P. Boynton—240(A)  
 Thoughts on technical education stimulated by a visit to Britain, J. A. Stratton—403(T)  
 Undergraduate student participating in academic research, Stanley S. Ballard—404(A)  
 What can we do for the less-than-mediocre students now crowding our colleges? Chalmer N. Patterson—322(A)
- Electricity and magnetism**  
 Behavior of magnetic materials, R. M. Bozorth—260  
 Calculus of measures and its application to the relation between rationalized and unrationalized electromagnetic systems, J. R. Barker and R. O. Davies—281  
 Cgs units of magnetic susceptibility and specific magnetization, Ernst M. Cohn and Morris Mentser—681  
 Clarification of some elementary concepts in electricity and magnetism, Irving Stein—693(L)  
 Concerning definitions of magnetic quantities, H. W. Katz—647(L)  
 Concerning the electric charge on a moving vehicle, Julius Sumner Miller—316(L)  
 Concerning the frequencies resulting from distortion, Berol L. Robinson—391(L)  
 Constant battery Wheatstone bridge, T. Townsend Smith—247  
 Coupled electrical-mechanical oscillatory systems, R. Stuart Mackay—575



- Crystal diodes in the electronics laboratory, Irving L. Kofsky—150(A)
- Definitions of electromagnetic units, Gustave R. Holm—472(L)
- Definitions of magnetic flux density and field intensity, J. V. Hughes—89
- Demonstration of Ohm's law and simple dc circuits, Robert M. Woods—401(A)
- Direct experimental method of measuring the ampere in absolute units, Donald S. Ainslie—657(A)
- Discussion concerning "Definitions of magnetic quantities," J. V. Hughes—648(L)
- Discussion of the report of the Coulomb's Law Committee of the AAPT, W. H. Michener—73(A)
- Dissipation factor anomaly, Raymond M. Bell and Harry Hill—389
- Electrification of a glass rod, John Tyndall—578(L)
- Electromagnetic radiation course for seniors, C. Sharp Cook—542
- Electronic differential analyzer, Keith R. Symon and Robert P. Poplawsky—53
- Electronics in a sophomore physics course, E. Allan Williams—373
- Electrons and nuclei, analogies to, D. Van Ostenburg and C. Kikuchi—574
- Electrostatic bird, John H. Reaves—705(T)
- Elimination of variables in the Blot equation, W. W. Slesator—692
- Equivalent networks of electron tubes, Saul Aronow—314
- Experiment on Maxwellian velocity distribution of electrons, Robert R. Meijer—407(A)
- Experiment with transistors for the elementary electronics laboratory course, F. H. Mitchell—493(A)
- Geometrical solution for a nuclear moment in a magnetic field, Roald K. Wangness—274
- Hall effect as a laboratory experiment, Philip Youngner—584(A)
- How to secure houses &c. from lightning, reprinted from *Poor Richard's Almanac*—74
- Illustrating magnetization and gyromagnetism, F. W. Warburton—499(A)
- Intermodulation distortion, oscilloscope pictures of, Richard C. Hitchcock—657(A)
- Interpretation of the Ampère experiments, Domina Eberle Spencer—409(A)
- Laboratory experiment on the Maxwellian distribution of thermionic electrons, Robert R. Meijer—705(T)
- Magnetic resonance phenomena, dynamic model of, Frank Verbrugge—603
- Membranes showing cation and anion inhibitory mechanisms, M. E. Wyman—584(A)
- Method for deriving various formulas in electrostatics and electromagnetism using Lagrange's trigonometric identities, Eddie Ortiz Mufiz—140
- Modified Barlow's wheel, Harald C. Jensen—692
- Motion of a conducting sphere in a uniform magnetic field, D. J. Beadlin, J. R. Shewell, and Ernest Ikenberry—418
- New sophomore electricity and magnetism experiment, H. V. Neher—403(T)
- Nonplanar circuit with a steady current in a uniform magnetic field, Henri Amar and Carl Oberman—518
- On the field emission initiated vacuum arc, W. P. Dyke, J. K. Trolan, W. W. Dolan, E. E. Martin, and J. P. Barbour—497(A)
- On the history of electricity prior to 1600, Duane Roller and Duane H. D. Roller—409(A)
- Physics of semiconductors, C. Zener—656(T)
- Physics of transistors, S. J. Angello—656(T)
- Prenatal history of electrical science, Duane Roller and Duane H. D. Roller—343
- Problem in electrostatics, Vernon Crawford—391(L)
- Projection oscilloscope, D. L. Burk and T. H. Fields—401(A); 657(A)
- Projects in advanced electricity for undergraduate students, Chas. Williamson—406(A), 567
- Quantum radiation of a given current, H. Koppe—548
- Semiconductors, Wayne Scanlon—704(T)
- Simple analog network for the solution of Poisson-type equations in cylindrical coordinates, J. F. Delord—497(T)
- Small scale dc motor experiment for the elementary laboratory, Grover C. Baker and George E. Bradley—689
- Small magnetron, Thomas B. Brown—705(T)
- Some fundamental experiments in transistor physics, J. R. Haynes—656(T)
- Some quantitative experiments with the magnetic top, Frank Verbrugge—407(A)
- Standard cells for a general physics laboratory, Willard L. Erickson—495(A)
- Steady-state shape of a wire cutting a uniform medium, Walter P. Reid—640
- Student computation in electricity, demonstrations to provide data for, Thomas J. Blisard and Bernard A. Greenbaum—109
- Student experiment on the latent heat of vaporization of electrons, Norman Saunders, Ray Pollock, and A. A. Bartlett—496(A)
- Sustained Foucault pendulums, R. Stuart Mackay—180
- Teaching applications of transistors, W. J. Leivo—656(T)
- Theory of mechanical electrometers, Raymond J. Munick—512
- Three lecture room demonstrations in the field of electricity, Bela G. Kolosvary—228
- Three new formulations of Newton's laws, P. LeCorbeiller—403(A)
- Transients in LC networks, William J. Shonka and Robert J. Lari—467
- Employment of physicists**
- Present status of the scientific manpower problem, J. C. Warner—73(T)
- Scientific womanpower—our country's need and what women's colleges are doing to supply physicists, Sister Mary Therese—404(A), 569
- Experiments**
- Accelerators in the 10 to 100-Bev range, experiments that might be performed with, L. S. Germain—498(A)
- Bifilar pendula, experimental encounter with, Richard M. Sutton—408(A)
- Cardinal points of a compound lens: an advanced laboratory experiment, Thomas B. Brown—406(A)
- Classroom antenna experiment, Clayton M. Zieman—97
- Cosmic rays, experiment on, P. G. Guest and Wendell M. Simmons—357
- Crystal diodes in the electronics laboratory, Irving L. Kofsky—150(A)
- Determination of alpha-particle range, undergraduate experiment for, Walter C. Michels and Eva Wiener—307
- Determination of the coefficient of surface tension by the bubble-length method, John C. Slonczewski and Ralph Heller—313
- Determination of the half-life of an isotope, experiment involving, Lawrence B. Robinson and Edgar M. Cole—469
- Direct experimental method of measuring the ampere in absolute units, Donald S. Ainslie—657(A)
- Dynamic coefficient of friction experiment, Robert Resnick—400(A)
- Education?—or merely training? XI. Swivel-chair or pipe-dream laboratory techniques, George Forster—239(A)
- Electrolysis of water: an experiment in atomic physics, Carl C. Sartain—493(A)
- Electronics in a sophomore physics course, E. Allan Williams—373
- Elementary electronics laboratory, experiment with transistors for, F. H. Mitchell—493(A)
- Experimental reactor physics course at the Oak Ridge School of Reactor Technology, E. D. Klema, R. J. Stephenson, and S. Taylor—300
- Exterior ballistics, Irving L. Kofsky—233(L)
- Freshmen laboratory experiment in echo ranging, George Barnes—572
- Geiger-Müller counter in the general physics laboratory, Walter Eppenstein—657(A)
- Hall effect as a laboratory experiment, Philip Youngner—584(A)
- Intermediate laboratory experiments at Cornell University, B. D. McDaniel—406(A)
- Interpretation of the Ampère experiments, Domina Eberle Spencer—409(A)
- Laboratory experiment on the dielectric constant of gases, Francis T. Worrell—407(A)
- Laboratory experiment on the Maxwellian distribution of thermionic electrons, Robert R. Meijer—705(T)
- Laboratory experiment with the actinoscope, Edwin P. Heinrich—705(T)

- Magnetic resonance phenomena, dynamic model of, Frank Verbrugge—603
- Maxwellian velocity distribution of electrons, experiment on, Robert R. Meijer—407(A)
- Mechanical resonance vibrations, experiment in, Boyce D. McDaniel—551
- Method of determining the heats of sublimation of low vapor pressure solids, K. E. Fitzsimmons—497(A)
- New sophomore electricity and magnetism experiment, H. V. Neher—403(T)
- Note on the study of uniformly accelerated motion, Henry S. C. Chen—657(A)
- Reflection method of surface tension measurement, Bela G. Kolossvary—510
- Research at liquid-helium temperature, Russell B. Scott—495(T)
- Resolving time of a binary counter: a laboratory exercise, R. A. McConnell—585
- Rocking experiment with two degrees of freedom, John Satterly—267
- Selected experiments for a course in advanced optics, Shang Yi Ch'en—406(A)
- Set-up for the vibrating wire experiment, Eddie Ortiz Muñiz—232
- Simple apparatus for central force investigations in an advanced undergraduate laboratory, Stephen Berko—407(A)
- Simple method of determining the latent heat of steam, T. G. Bullen—645
- Small scale dc motor experiment for the elementary laboratory, Grover C. Baker and George E. Bradley—689
- Some fundamental experiments in transistor physics, J. R. Haynes—656(T)
- Some quantitative experiments with the magnetic top, Frank Verbrugge—407(A)
- Some remarks on Melde's experiment, Paul F. Bartunek—495(A)
- Student experiment on the latent heat of vaporization of electrons, Norman Saunders, Ray Pollock, and A. A. Bartlett—496(A)
- Transients in L-C networks, William J. Shonka and Robert J. Lari—467
- Undergraduate electron diffraction experiment, William C. Elmore—407(A)

#### General education

- How to read science: another approach to general education, Carl E. Adams—484(A)
- Laboratory teaching in general education courses, C. L. Henshaw—403(T)

#### General physics, educational aspects

- Achievement of physics students with and without laboratory work, Haym Kruglak—14
- Aims and methods in the introductory physics laboratory, V. E. Eaton—403(T)
- Fluid dynamics in physics teaching, R. J. Seeger—29
- Mathematics requirements for our general physics courses, Lawrence W. Hartel—496(A)
- Potentialities of the introductory physics course in developing mathematical intuition, Ira M. Freeman—403(A)
- Premedical courses in physics—advantages and present trends, E. L. Harrington—656(T)
- Undergraduate laboratory teaching, Sanborn C. Brown, Presiding—403(T)

#### General physics, instructional techniques

- Closed differential pulley: analysis of its rotational and linear motions, Laurence Ellsworth Dodd—112
- Demonstrations to provide data for student computation in electricity, Thomas J. Blisard and Bernard A. Greenbaum—109
- Experiment in teaching: incomplete symmetry of physical systems, W. W. Happ—453
- Great men of physics—a teaching device with a cultural approach, John A. Day—498(A)
- Improvisations, Louis R. Weber—703
- Magnetic tape recorder as a teaching aid in physics, Albert V. Baez and F. W. Warburton—499(A)
- Method of presenting centrifugal force to sophomore students, John V. Kline—496(A)
- Note on authority, W. P. Clark—578(L)
- Oblique coordinates in general physics, Henry S. C. Chen—404(A)

- Operational approach for the classroom development of basic concepts and Newton's laws, Carl J. Rigney—322(A)
- On a routine analytic method for the solution of problems in statics, A. W. Simon—244
- Place of Newton's first law in elementary physics, James L. Anderson—403(T)
- Practical aids for physics teachers, Thomas H. Osgood—266, 386, 484, 583, 652, 680, 703
- Project approach for the elementary laboratory, II, Burton Henke—239(A)
- Some teasers for conclusion jumpers, Richard M. Sutton—658(A)
- Teaching the connection between the physical world and abstract mathematical analysis, S. De Benedetti—73(A)
- Transistors, teaching applications of, W. J. Leivo—656(T)
- Unifying concepts in engineering physics, F. T. Adler—658(T)
- Use of mnemonics in physics teaching, W. E. Haisley—405(A)
- Use of the group experiment in preliminary stages of laboratory instruction in elementary physics, W. P. Kaney and R. A. Peck, Jr.—405(A)

#### Geophysics

- Electrical well logging, V. Allan Long—496(A)

#### Heat and thermodynamics

- Behavior of a flat whisky bottle when heated, Julius Sumner Miller—64(L)
- Education?—or merely training? XI. Swivel-chair or pipe-dream laboratory techniques, George Forster—239(A)
- Expansion of an oval bottle, John Satterly—471(L)
- Heat of sublimation of sodium iodide, Howard G. Hanson—584(A)
- Heat transfer to a boiling liquid, J. Elmer Rhodes, Jr.—67(L)
- Ideal gas equation, Luigi Z. Pollara and Frank Z. Pollara—387
- Kirchhoff's radiation law demonstrations, Haym Kruglak—466
- Method of determining the heats of sublimation of low vapor pressure solids, K. E. Fitzsimmons—497(A)
- Modern applications of an old theory, Leonard R. Ingersoll—321(A)
- Negative coefficient of expansion of stretched rubber, George Barnes—142(L)
- New analogy in transient heat conduction, R. E. Collins—501
- New examination of the laws of thermodynamics, Robert B. Green—658(A)
- Projection thermometer for lecture demonstrations, Harold M. Waage—465
- Research at liquid-helium temperature, Russell B. Scott—495(T)
- Simple method of determining the latent heat of steam, T. G. Bullen—645

#### History and biography

- Impressions of great German scientists as recalled by a student of physics in Munich in the early 1930's, Margarete Bruch—322(A)
- Note in memory of blind John Gough, Allen L. King—231
- On the history of electricity prior to 1600, Duane Roller and Duane H. D. Roller—409(A)
- Prenatal history of electrical science, Duane Roller and Duane H. D. Roller—343
- Reproductions of prints, drawings, and paintings of interest in the history of physics, E. C. Watson. 50. Fluents and fluxions—51; 51. Caricature of Sir John Leslie—107; 52. Frontispiece and vignette from Chérubin's *La dioptrique oculaire*—162; 53. Photograph of H. A. Lorentz, H. Kamerlingh Onnes, Niels Bohr, and Paul Ehrenfest—463; 54. Invention of spectacles—555; 55. Titlepage from Robert Grosseteste's *Lines, Angles and Figures*—642; 56. Four plates from *A compleat system of opticks* by Robert Smith—673
- Teaching physics 1900 to 1906, W. P. Boynton—240(A)

#### Laboratory arts and techniques

- Course in laboratory and shop practices for physics majors, Walter Eppenstein—406(A)
- Inexpensive, easily controlled process for developing 400-micron nuclear emulsions, Mary B. Summerfield—150(T)
- Nondestructive testing of wood, S. V. Galginitis—499(T)
- Preparation of specimens for use in an electron microscope, Mildred Bulliet—321(A)
- Research techniques, undergraduate course in, S. C. Brown—403(T)
- Ultrasonic interferometer as a screw calibrating instrument, Romard Barthel—316(L)

**Laboratory organization**

- Achievement of physics students with and without laboratory work, Haym Kruglak—14
- Aims and methods in the introductory physics laboratory, V. E. Eaton—403(T)
- Electronics in a sophomore physics course, E. Allan Williams—373
- Incentive grading for the basic laboratory reports, Ray M. Morrison and M. S. McCay—494(A)
- Individual projects on the intermediate level as a training aid and as an economy measure, Otis B. Young—573
- Intermediate laboratory physics—methods and aims at the University of Rhode Island, William E. Plaisted—405(A)
- Laboratory teaching in general education courses, C. L. Henshaw—403(T)
- Making the laboratory a more effective scientific experience, Glen Pippert and Duane Roller—617
- Modern physics laboratory course involving construction techniques, Donald C. Worth—239(A)
- Project approach for the elementary laboratory, II, Burton Henke—239(A)
- Projects in advanced electricity for undergraduate students, Chas. Williamson—406(A), 567
- Survey of elementary physics laboratories, Sanborn C. Brown—411
- Teaching a philosophy of experimentation in a course in electrical measurements, Francis T. Worrell—296
- Undergraduate laboratory teaching, Sanborn C. Brown, Presiding—403(T)
- Use of the group experiment in preliminary stages of laboratory instruction in elementary physics, W. P. Raney and R. A. Peck, Jr.—405(A)
- Use of transistors, dielectric amplifiers, and magnetic amplifiers as a means of motivation, E. Allan Williams—499(A)

**Language**

- International language for science? Frederik J. Belinfante—142(L); Forrest F. Cleveland—471(L)
- Functional writing—28
- Need and place of a foreign language for a physics major or an engineer, Earland Ritchie—239(T)

**Light**

- Analysis and synthesis of optical images, J. Elmer Rhodes, Jr.—337; Erratum—427
- Cardinal points of a compound lens: an advanced laboratory experiment, Thomas B. Brown—406(A)
- Čerenkov radiation in a dispersive medium, H. Motz and L. I. Schiff—258
- Concept of radiation measurements, Donald J. Lovell—409(A); 459
- Construction of a diffraction grating spectrograph, R. L. Purbrick—241
- Demonstration models of retardation plates in polarized light, Wallace A. Hilton—466
- Demonstration of the two-wavelength method of focussing by diffraction, Donald D. Robinson—499(A)
- Demonstrations with half-wave plates, J. G. Wimans—170
- Effect of absorption by the material of the prism on its resolving power, Mahendra Singh Sodha—313
- Electroluminescence of phosphors, Alfred E. Martin—409(A)
- Four plates from *A complete system of optics* by Robert Smith, E. C. Watson—673
- Graphical demonstration of white light interference, Alan C. Traub—75
- Graphical solutions to optical problems of three different types, Eric J. Irons—1
- Microwave measurement of variations in the atmospheric index of refraction, George Birnbaum—705(T)
- Mirror, demonstration using window glass, Albert V. Baez—63
- Observations on the smoke trail of a sky-writer, Julius Sumner Miller—391(L)
- On the resolving power of a prism, K. Majumdar and Mahendra Singh Sodha—387
- Physical-optics approach to lens and mirror problems, Lewis S. Combes—409(A)
- Presenting virtual objects by demonstration and a graph to present real objects and images, Marvin J. Pryor—408(A)
- Prismatic reflections, Kent H. Bracewell—584(A)

- Radiation pressure against perfect reflectors, J. Elmer Rhodes, Jr.—683
- Selected experiments for a course in advanced optics, Shang Yi Ch'en—406(A)
- Self-centered shadow, Stephen F. Jacobs—234(L); R. C. Wanta—578(L)
- Sharp shadows as "images," E. Scott Barr—493(A)
- Some generalizations in geometrical optics derived by a convergence method, Eric J. Irons—590
- Some optical filters, Nora Mohler—150(T)
- Spectroscopic measurements with the echelle, R. A. Loring—239(T)
- Steadman convergence figure of light intensity, F. M. Steadman—409(A)
- Tapered-film interference filter, Winthrop R. Wright—406(A)
- Theory of fine structure pressure broadening, Makoto Takeo—497(A)
- Unified treatment of prisms and gratings, Richard Hanau—494(A)

**Mathematics**

- Administrative problems in high school physics and mathematics, Alfred Beattie—656(T)
- Adding two distributions, Edward C. Varnum—321(A)
- Approximate sum of numerical series, computation of moment of inertia by, Eddie Ortiz Muñiz—11
- "Best" straight line among the points, Ralph Hoyt Bacon—428
- Bohr formula for nonrelativistic elliptic orbits, Herbert Goldstein—688
- College entrance requirements in mathematics and physics, John Daniels—656(T)
- Complementarity in the life sciences, Elihu Fein—141(L); William G. Pollard—142(L)
- Extension of remarks on the derivation of the stress deviator tensor, Orson L. Anderson—65(L)
- Fluents and fluxions, E. C. Watson—51
- General physics course, mathematics requirements for, Lawrence W. Hartel—496(A)
- Geometric approach to nonrelativistic spin theory, W. T. Payne—621
- Lagrange's trigonometric identities, use in electrostatics and electromagnetism, Eddie Ortiz Muñiz—140
- Method of the Laplace transform, longitudinal vibrations of a vertical column by, L. H. Hall—287
- Potentialities of the introductory physics course in developing mathematical intuition, Ira M. Freeman—403(A)
- Rejection of outlying observations, Frank Proschan—520
- Remarks concerning the paper "Conditions for the derivation of the stress deviator tensor," Milton O. Peach—64(L)
- Short method for the evaluation of Meek's equation for sparking potentials, Charles G. Miller—500(A)
- Simple analog network for the solution of Poisson-type equations in cylindrical coordinates, J. F. Delord—497(T)
- Trend analysis of physical data, G. E. Hudson—362
- Trigonometry before physics? W. A. Murtaugh, O.P.—317(L)

**Mechanics, classical**

- Anharmonic resonance, Herbert Jehle and Julius H. Cahn—526
- Application of Dirac's  $\delta$ -function to some problems in classical physics, L. S. Kothari—99
- Application of the idea of group velocity, E. Mendoza—657(T)
- Closed differential pulley: analysis of its rotational and linear motions, Laurence Ellsworth Dodd—112
- Computation of the moment of inertia of various bodies by the approximate sum of numerical series, Eddie Ortiz Muñiz—11
- Coulomb friction with several blocks, John S. Thomsen—446
- Coupled electrical-mechanical oscillatory systems, R. Stuart Mackay—575
- Curb feelers and physics, Frank Petry—499(A)
- Demonstration of parabolic velocity distribution in laminar flow, Alexander Kolin—409(A); 619
- Dynamic model of magnetic resonance phenomena, Frank Verbrugge—603
- Expansion of a rotating wheel, Lester L. Skolil and Donald A. Norton—239(T)
- Experiment in mechanical resonance vibrations, Boyce D. McDaniel—551
- Experimental encounter with bifilar pendula, Richard M. Sutton—408(A)

- Extension of remarks on the derivation of the stress deviator tensor, Orson L. Anderson—65(L)
- Extension of the conical pendulum problem and its demonstration, Julius Sumner Miller—315(L)
- Exterior ballistics, Irving L. Kofsky—233(L)
- Falling chain—an exact method, D. S. Burch and R. Geballe—497(A), 570
- Fluid dynamics in physics teaching, R. J. Seeger—29
- Frequencies resulting from distortion, Chas. Williamson—68(L)
- Further demonstrations in analytical mechanics, Julius Sumner Miller—143(L)
- How to confuse dimensions in mechanics, John S. Thomsen—705(T)
- Higher modes of oscillation of a uniform chain, R. Allan Hunt—465
- Hydraulic conductivity, Harley Haden—499(A)
- Longitudinal vibrations of a vertical column by the method of Laplace transform, L. H. Hall—287
- Momentum thrust of a rocket, R. K. Sherburne and W. L. Weeks—139
- Notes on the up-and-down vibrations of a hanging chain partly counterbalanced by a suspended body, Vernon Crawford—574
- On a routine analytic method for the solution of problems in statics, A. W. Simon—244
- On the derivation of the principle of angular momentum about the mass center, G. Kuerti—469
- Possible motions of a sphere suspended on a string (the simple pendulum), J. V. Hughes—47
- Principal frequencies of a double spring-mass system, William Pong—546
- Pseudo-standing waves in an infinite medium, Robert Maupin and E. E. Mayo—498(A)
- Remarks concerning the paper "Conditions for the derivation of the stress deviator tensor," Milton O. Peach—64(L)
- Rocking experiment with two degrees of freedom, John Satterly—267
- Shearing stress in a closely coiled helical spring, Reuben Benumof and Mitchel Benumov—62
- Some analogies of the tippe top to electrons and nuclei, D. Van Ostenburg and C. Kikuchi—574
- Some remarks on D. Bernoulli's formula, Z. Klemensiewicz—144(L)
- Surface energy, a mode for energy absorption during impact, John S. Rinehart—305
- Sustained Foucault pendulums, R. Stuart Mackay—180
- Three new formulations of Newton's laws, P. LeCorbeiller—403(A)
- Two ballistics problems of future transportation, William A. Allen—83
- Two interesting problems and a proposal for stimulating young physics teachers and for inducing them to remain in teaching, Julius Sumner Miller—240(A)
- Uniformly accelerated motion, study of, Henry S. C. Chen—657(A)
- Mechanics, quantum**
- Bohr formula for nonrelativistic elliptic orbits, Herbert Goldstein—688
- Canonical field theory—a prototype example, Bruce W. Knight, Jr.—421
- "Cycle" in a physical interpretation of Planck's constant ( $h$ ) for circular dynamics, Bernard L. Brinker—74(A)
- Eckart conditions for a polyatomic molecule, Salvador M. Ferigle and Alfons Weber—102
- Geometric approach to nonrelativistic spin theory, W. T. Payne—621
- Motion of a particle across a potential jump, L. S. Kothari—468
- Noncommutative property of the quantum-mechanical angular momentum operator by vector methods, P. D. Kunz—497(A)
- Quantum-mechanical methods in classical physics, David L. Falkoff—150(T)
- Quantum radiation of given current, H. Koppe—548
- Scattering theory—a second note, David Park—540
- Spin waves in ferromagnetic and antiferromagnetic materials, F. Keffer, H. Kaplan, and Y. Yafet—250
- Mesons**
- Interaction of  $\pi$  mesons with atomic nuclei, Norman C. Francis and Kenneth M. Watson—659
- Microwaves**
- Classroom antenna experiment, Clayton M. Zieman—97
- Determination of molecular structure from microwave spectroscopic data, J. Kraitichman—17
- Microwave measurement of variation in the atmospheric index of refraction, George Birnbaum—705(T)
- Microwave spectroscopy of gases, R. G. Nuckolls—7051(T)
- Particle properties of radiant energy in wave guides, Walter R. Raudorf—25; 693(L)
- Physics of microwave calorimeters, Ernest C. Okress—330
- Reflection and transmission of microwaves through prisms of sulfur and salt, Rowan O. Brick—498(A)
- Military application of physics**
- Long range implications of atomic warfare, Albert W. Bellamy—239(T)
- Modern physics**
- Some concepts in modern physics, Alexander W. Stern—629
- Modern physics laboratory-course involving construction techniques, Donald C. Worth—239(A)
- Nuclear physics**
- Advances in knowledge of nuclear forces, G. Breit and M. H. Hull, Jr.—184
- Atomic standards, R. D. Hunt—499(T)
- Beta-ray surface-dosage rates, extrapolation chamber for determining, John M. Brabant—238(A)
- Classical neutron model, Arthur E. Ruark—493(A)
- Course in radioactive determinations, Robert H. McFarland and Richard E. Hein—325
- Elementary theory of neutron sources in reactors, A. Victor Masket—151
- Experiment involving the determination of the half-life of an isotope, Lawrence B. Robinson and Edgar M. Cole—469
- Geometrical solution for a nuclear moment in a magnetic field, Roald K. Wangnes—274
- Installation and operation of ten-kilocurie cobalt-60 gamma-radiation source, John V. Nehemias, L. E. Brownell, W. W. Meinke, and E. W. Coleman—405(A)
- Interaction of  $\pi$  mesons with atomic nuclei, Norman C. Francis and Kenneth M. Watson—659
- Interaction of protons with free and bound neutrons in the 100-Mev region, Karl Strauch—150(T)
- Nuclear magnetism, Edward M. Purcell—403(T)
- Nuclei, analogies of tippe top to, D. Van Ostenburg and C. Kikuchi—574
- Photodisintegration of  $\text{Mo}^{92}$  and  $\text{Mo}^{100}$ , William A. Butler—584(A)
- Undergraduate experiment for the determination of alpha-particle range, Walter C. Michels and Eva Wiener—307
- Uniform model of the nucleus, Izabella Goldin Weinberg and J. M. Blatt—124
- Philosophy of science**
- Complementarity in the life sciences, Elihu Fein—141(L); William G. Pollard—142(L)
- Teaching a philosophy of experimentation in a course in electrical measurements, Francis T. Worrell—296
- Photography**
- Kerr cell photography at exposures shorter than one microsecond, R. V. Heine-Geldern—657(A)
- Properties of matter**
- Activation energies of the selenium-tellurium alloys, Harry H. Hall, Daniel T. Hedden, and Thomas J. Turner—150(T)<sup>1</sup>
- Behavior of magnetic materials, R. M. Bozorth—260
- Coulomb friction with several blocks, John S. Thomsen—446
- Determination of the coefficient of surface tension by the bubble-length method, John C. Slonczewski and Ralph Heller—313
- Dynamic coefficient of friction experiment, Robert Resnick—400(A)
- Effect of absorption by the material of the prism on its resolving power, Mahendra Singh Sodha—313
- Laboratory experiment on the dielectric constant of gases, Francis T. Worrell—407(A)
- Latent heat of steam, simple method of determining, T. G. Bullen—645
- Membranes showing cation and anion inhibitory mechanisms, M. E. Wyman—584(A)



- Sodium iodide, heat of sublimation of, Howard G. Hanson—584(A)  
Spin waves in ferromagnetic and antiferromagnetic materials, F. Keffer, H. Kaplan, and Y. Yafet—250  
Surface tension, reflection method of measurement, Bela G. Kolossvary—510
- Radio and television**  
Classroom antenna experiment, Clayton M. Zieman—97  
Frequencies resulting from distortion, Chas. Williamson—68(L)  
Striations in electromagnetic stationary waves, Grant O. Gale—389
- Relativity**  
On the linearization of a relativistic Hamiltonian, Henri Mitler—473(L)  
Relativistic rocket theory, W. L. Bade—310
- Reports, announcements, and news**  
Book and sound records of scientific meetings, J. G. Winans—405(A)  
Colloquium of College Physicists—179  
Education for physics in Spain, Salvador Ferigle—400(T)  
International fellowships and professorships, Francis Young—656(T)  
Mellon Institute—410  
My experiences teaching physics in Indonesia, Sybrand Broersma—400(T)  
Officers for the physics division, ASEE—628  
Other Ford Foundation programs concerned with high school-college integration, Bernard Watson—657(T)  
Physics in Burma, Than Tin—400(T)  
Physics teaching in Baghdad, Albert V. Baez—239(A)  
Practical aids for physics teachers, Thomas H. Osgood—266, 386, 484, 583, 652, 680, 703  
Science is fun at the Buhl Planetarium, Richard C. Hitchcock—73(A)  
Science talent search—500  
Symposium on molecular structure—322  
Welcome, Arthur L. Darper—400(T)  
Welcoming remarks, Robert F. Chandler, Jr.—150(T)  
Work of the National Science Foundation, Paul E. Klopsteg—704(T)
- Rockets**  
Momentum thrust of a rocket, R. K. Sherburne and W. L. Weeks—139  
Relativistic rocket theory, W. L. Bade—310  
Two ballistics problems of future transportation, William A. Allen—83
- Secondary-school physics**  
Administrative problems in high school physics and mathematics, Alfred Beattie—656(T)  
County rotation plan for high school physics laboratories, R. J. Reithel—495(A)  
Guidance programs in high school and the stimulation of interest in physics, Harold F. Bernhardt—656(T)  
Graduate training for high school physics teachers and cooperation between college and high school physics departments, Donald C. Martin—494(A), 614  
Need for more and better trained high school physics teachers, Donald C. Martin—390(L)  
Program to inform high school students about opportunities in physics, W. C. Kelly—404(A)  
Secondary school textbook, Charles A. Compton—537  
Terminal vs college preparatory physics in high school, D. M. Bennett—495(T)
- Sound**  
Bragg method demonstrated with sound waves, George Barnes—688  
Comparison of the just scale and the scale of equal temperament, Archie Wade, Jr.—240(T)  
Concerning the frequencies resulting from distortion, Berol L. Robinson—391(L)  
Demonstration of subjective harmonics, Charles Williamson—316(L)  
Demonstration of the Doppler effect, Robert H. Randall—407(A)  
Doppler effect equation, J. G. Winans—658(A)  
Echo ranging with audiofrequencies, George Bradley—159  
Exciting a Kundt's tube with a siren, K. A. Parsons—392(L); H. E. Hammond—475(L)  
Freshman laboratory experiment in echo ranging, George Barnes—572  
Kundt's tube projection demonstration, Albert V. Baez—64(L)
- Low-pressure ultrasonic condenser microphone, Carl E. Adams—238(T)  
Parameters characterizing the strength of a shockwave, R. N. Hollyer and Otto Laporte—610  
Photoelastic studies of sound waves in liquids, John Mitchell and C. E. Adams—499(A)  
Physics of the organ flue pipe, Derwent M. A. Mercer—376  
Ultrasonic interferometer as a screw calibrating instrument, Romard Barthel—316(L)
- Teacher training**  
Certification of physics teachers, Ralph W. Lefler—656(T)  
Graduate training for high school physics teachers and cooperation between college and high school physics departments, Donald C. Martin—494(A)  
Need for more and better trained high school physics teachers, Donald C. Martin—390(L)  
Responsibilities and training of physics teachers, T. H. Osgood—492(T)  
Training of high school physics teachers and cooperation between college physics departments and high schools, Donald C. Martin—614  
Two interesting problems and a proposal for stimulating young physics teachers and for inducing them to remain in teaching, Julius Sumner Miller—240(A)
- Testing, theory and techniques**  
Concerning final examinations and some interesting problems, Julius Sumner Miller—500(T)  
My favorite type of examination question, Lester L. Skollt—500(T)  
New type quiz questions in physics, Julius Sumner Miller—404(A)  
Unit test on light for college course in general physics, William T. Wilks—652  
What is the proper examination method? A. David—472(L)
- Textbooks**  
Book Review: *A policy for scientific and professional manpower*, George M. Belknap—581  
Book Review: *A university text-book of physics, Volume III*, heat by J. H. Awwery, Walter Hirschfeld—320  
Book Review: *Advanced mathematics in physics and engineering* by Arthur Bronwell, R. J. Stephenson—478  
Book Review: *An introduction to scientific research* by E. Bright Wilson, Jr., Jesse W. M. DuMond—392  
Book Review: *An introduction to thermodynamics, the kinetic theory of gases, and statistical mechanics* by Francis Weston Sears, Boris Leaf and A. B. Cardwell—580  
Book Review: *Calculus—a modern approach* by Karl Menger, Fritz Herzog—398  
Book Review: *Cloud chamber photographs of the cosmic radiation* by G. D. Rochester and J. G. Wilson, H. V. Neher—234  
Book Review: *Comets and meteor streams* by J. G. Porter, N. T. Bobrovnikoff—320  
Book Review: *Cosmology—elements of a critique of the sciences and of cosmology* by Fernand Renouir, R. Barthel—395  
Book Review: *Electronics, physical principles and applications* by Arthur O. Williams, Jr., John N. Cooper—580  
Book Review: *Elements of thermodynamics* by E. O. Hercus, F. H. Crawford—582  
Book Review: *Elements of wave mechanics* by N. F. Mott, M. E. Rose—70  
Book Review: *Essentials of microwaves* by Robert B. Muchmore, C. L. Andrews—394  
Book Review: *Flying saucers* by Donald H. Menzel, Seville Chapman—479  
Book Review: *Fundamentals of thermometry* by J. A. Hall, Robert L. Weber—582  
Book Review: *General education in science* by I. Bernard Cohen and Fletcher G. Watson, Clement L. Henshaw—147  
Book Review: *Heat transfer phenomena* by R. C. L. Bosworth, H. B. Wahlen—394  
Book Review: *High-energy particles* by Bruno Rossi, William B. Fretter—236  
Book Review: *High speed photography—its principles and applications* by George A. Jones, M. Sultanoff—478  
Book Review: *Impact of science on society*, Ira M. Freeman—148

- Book Review: *Industrial high vacuum* by J. R. Davy, Kenneth Hickman—68
- Book Review: *Introduction to geometrical and physical optics* by Joseph Morgan, Richard Hanau—696
- Book Review: *Introduction to solid state physics* by Charles Kittel, D. L. Dexter—650
- Book Review: *Introduction to theoretical physics* by Leigh Page, E. L. Hill—480
- Book Review: *Low temperature physics* by F. E. Simon, N. Kurti, J. F. Allen, and K. Mendelsohn, C. T. Lane—146
- Book Review: *Mechanics and properties of matter* by Reginald J. Stephenson, Martin J. Klein—71
- Book Review: *Mechanics, lectures on theoretical physics* by Arnold Sommerfeld, W. V. Houston—399
- Book Review: *Mesons—a summary of experimental facts* by Alan M. Thorndyke, R. F. Christy—397
- Book Review: *Methods of applied mathematics* by F. B. Hildebrand, David Park—480
- Book Review: *Modern physics* by F. W. Van Name, Jr., Arthur Beiser—318
- Book Review: *Mr. Tompkins learns the facts of life* by George Gamow, E. Scott Barr—649
- Book Review: *Nuclear stability rules* by N. Feather, Alex E. S. Green—395
- Book Review: *Photoelectric tubes* by A. Sommer, Albert S. Eisenstein—697
- Book Review: *Physics and medicine of the upper atmosphere*, edited by Clayton S. White and Otis O. Benson, Jr., E. L. Harrington—319
- Book Review: *Physics for science and engineering students* by W. H. Furry, E. M. Purcell, and J. C. Street, E. N. Jensen—697
- Book Review: *Practical thermometry* by J. A. Hall, Robert L. Weber—582
- Book Review: *Principles of modern acoustics* by George W. Swenson, Jr., Isadore Rudnick—695
- Book Review: *Proceedings of the London Conference on Optical Instruments 1950*, David M. Gates—145
- Book Review: *Radiations and living cells* by F. G. Spear, L. F. Wolterink—650
- Book Review: *Radio astronomy* by Bernard Lovell and J. A. Clegg, Edward O. Hulburt—236
- Book Review: *Selected science teaching ideas of 1958*, edited by R. Will Burnett, Alexander Efron—695
- Book Review: *Sir James Jeans* by E. A. Milne, F. Zwicky—477
- Book Review: *Stars in the making* by Cecilia Payne-Gaposchkin, G. J. Odgers—481
- Book Review: *Symbolic logic, an introduction* by Frederic Brenton Fitch, Albert L. Hammond—237
- Book Review: *Symmetry* by Hermann Weyl, Rogers D. Rusk—72
- Book Review: *Textbook on sound* by J. W. Winstanley, Robert T. Beyer—319
- Book Review: *The astronomical universe* by Wasley S. Krogdahl, Philip S. Riggs—69
- Book Review: *The atom story* by J. G. Feinberg, Robert S. Shaw—482
- Book Review: *The classical theory of fields* by L. Landau and E. Lifschitz, Chihiro Kikuchi—392
- Book Review: *The elements of nuclear reactor theory* by Samuel Glasstone and Milton C. Edlund, Clifford Beck and Raymond L. Murray—396
- Book Review: *The nature of some of our physical concepts* by P. W. Bridgman, V. F. Lenzen—71
- Book Review: *The radio amateur's handbook*, Donald H. Baker—581
- Book Review: *The scientific adventure, essays in the history and philosophy of science* by Herbert Dingle, L. Brillouin—651
- Book Review: *The theory of relativity* by C. Möller, Nathan Rosen—148
- Book Review: *Theoretical nuclear physics* by John M. Blatt and Victor F. Weisskopf, Charles L. Critchfield—235
- Book Review: *Theory of superconductivity* by M. von Laue, C. F. Squire—145
- Book Review: *Thermal diffusion in gases* by K. E. Grew and T. L. Ibbs, F. Kingsley Elder, Jr.—477
- Book Review: *Thousands of science projects*, compiled by M. E. Patterson and J. H. Kraus, William A. Cuff—579
- Book Review: *Ultrasonic physics* by E. G. Richardson, Earnest Yeager—69
- Book Review: *Vector analysis* by Earl C. Rex, Mary H. Payne—149
- Four plates from *A complete system of optics* by Robert Smith, E. C. Watson—673
- Publications received—698
- Secondary school textbook, Charles A. Compton—537
- Titlepage from Robert Grosseteste's *Lines, angles and figures*, E. C. Watson—642
- Units, dimensions, and terminology**
- Calculus of measures and its application to the relation between rationalized and unrationalized electromagnetic systems, J. R. Barker and R. O. Davies—281
- Cgs units of magnetic susceptibility and specific magnetization, Ernst M. Cohn and Morris Mentser—681
- Concerning definitions of magnetic quantities, H. W. Katz—647(L)
- "Cycle" in a physical interpretation of Planck's constant ( $h$ ) for circular dynamics, Bernard L. Brinker—74(A)
- Definitions of electromagnetic units, Gustave R. Holm—472(L)
- Dimensional theory: dimensionless secondary quantities, L. L. Whyte—323
- Discussion concerning "Definitions of magnetic quantities," J. V. Hughes—648(L)
- How much is a billion? Frederik J. Belinfante—474(L)
- How to confuse dimensions in mechanics, John S. Thomsen—705(T)
- Magnitude of the newton, Carl C. Sartain—144(L)
- On the use of dimensional analysis, Julius Sumner Miller—578(L)
- Parameters characterizing the strength of a shockwave, R. N. Hollyer and Otto Laporte—610
- Proposed procedure for selecting and using symbols for physical units, Duane Roller—293
- Synthesis and use of unreal physical quantities, Otto Schmidt—584(T)
- Units of mass and force, Mario Iona—496(A)
- Wanted: generic term for a class of units, Cecil O. Riggs—73(A)
- Visual materials and methods**
- Oscilloscope pictures of intermodulation distortion, Richard C. Hitchcock—657(A)
- Projection oscilloscope, D. L. Burk and T. H. Fields—401(A), 657(A)
- Two new physics films, circular motion, Carnot cycle and Kelvin scale—321(T)
- X-rays**
- Bragg method demonstrated with sound waves, George Barnes—688
- Demonstrations with the Bragg model of a crystal lattice, Frederic Keffer—657(A)

